June 10, 2016

U.S. Environmental Protection Agency
Document Processing Desk (REGFEE)
Office of Pesticde Programs (7504P)
Room S4900, One Potomac Yard
2777 Crystal Drive
Arlington, VA 22202

Attn: Julie Chao

Dear Ms. Chao:

Ecolab is submitting an efficacy testing protocol for review under PRIA category A521[1]. A copy of the protocol is included with this cover letter.

The protocol we are submitting is based on the method:

1. ASTM E2406-09 Standard Test Method for Evaluation of Laundry Sanitizers & Disinfectants for Use in High Efficiency Washing Operations

The test system used in the protocol is prepared according to method:

2. ASTM E2839-11 Production of *Clostridium difficile* Spores for Use in Efficacy Evaluations of Antimicrobial Agents

In order to provide a quantitative measurement of spore reduction the enumeration of control and treated samples is based on the method:

3. US EPA Office of Pesticide Programs MB-31-03 Standard Operating Procedure for Quantitative Disk Carrier Test Method (QCT-2) Modified for Testing Antimicrobial Products Against Spores of *Clostridium difficile* (ATCC43598) on Inanimate, Hard, Non-porous Surfaces

EPA's MB-31 references ASTM Standard E2197-11: Standard Quantitative Disk Carrier Test Method for Determining Bactericidal, Virucidal, Fungicidal, Mycobactericidal and Sporicidal Activities of Chemicals.

The novel aspect of this protocol is the combination of these three methods to provide a means to assess the disinfectant efficacy of a laundry additive against spores of *C. difficile*. Following the advice of EPA Microbiologist Dr. Ibrahim Laniyan[2] we utilized the methodology for enumeration of spores (Membrane Filtration Plating) detailed in the QCT2 method (listed as method 3 above) in order to demonstrate the desired 6 log reduction of spores.

Detailed explanations of how the proposed method will allow adequate assessment of a product's performance are provided in the following points.

[1] Review of public health efficacy study protocol within AD, per AD Internal Guidance for the Efficacy Protocol Review Process; applicant-initiated; Tier 1. Decision review time 3 months.
[2] Meeting held on February 11th 2016 with AD - notes can be found in Appendix A

1. The method product performance we are trying to measure is as follows:
    a. We are measuring the effectiveness of a liquid antimicrobial laundry additive for killing spores of *C. difficile* on fabric and in wash water following a single wash under simulated laundry processing conditions. Controlling the number one US healthcare acquired infectious agent, *C. difficile*[3], is an important public health issue for both healthcare and commercial laundry industries.
2. Reasons why the method will allow adequate assessment of performance
    a. The method has been combined with elements of the QCT2 method to allow accurate enumeration of control and treated samples.
        i. The QCT2 method, based on the ASTM Standard E2197-11 incorporates membrane filteration plating for enumeration of spores. This adjustment changes the original laundry method from a qualitative method to a quantitative method satisfying recent *C. difficile* efficacy performance guidance[4] and giving us the ability to demonstrate a 6 log reduction.
    b. The method is practical for other products and enforcement purposes
        i. The method can also be used for other liquid antimicrobial agents – it is not exclusive to Ecolab's products.
    c. The test organism is relevant to public health
        i. The method uses *Clostridium difficile* (ATCC 43598) consistent with EPA guidance.
    d. The method of application of the liquid antimicrobial agent is representative of those methods used in commercial laundries.
        i. The method uses a laundrometer apparatus that simulates a laundry wash process at commercial laundry facilities. The apparatus incorporates rotations and temperature control to allow simulation of mechanical action temperature profiles typical of the laundry wash process.
    e. The method includes a representative performance control.
        i. The method uses a water control to establish a log reduction.
    f. The method criteria for *C. difficile* laundry disinfection claims are reasonable
        i. The method allows for a *C. difficile* laundry disinfection claim to be added to an EPA-registered antimicrobial pesticide. The spore reduction claims must be commensurate with the level of efficacy achieved and be 6 log (99.9999%) or greater. Example claims are listed below:
            1. Disinfects *Clostridium difficile* on fabric in the laundering process
            2. Kills 99.9999% of *Clostridium difficile* on fabric in the laundering process
            3. Kills a minimum 99.9999% of *Clostridium difficile* on fabric in the laundering process

An example of the subject product, its intended use pattern, and a proposed label claim is provided in the following points:

[3] *C. difficile* was estimated to cause almost half a million infections in the United States in 2011, and 29,000 died within 30 days of the initial diagnosis www.cdc.gov

[4] Guidance for the Efficacy Evaluation of Products with Sporicidal Claims Against Clostridium difficile (June 2014) ww.epa.gov

1. The product is Ecolab's AdvaCare 120 Sanitizer/Sour [Disinfectant] (EPA Reg. No. 1677-193). Please note, this product already has instructions for laundry sanitization and laundry disinfection.
2. The intended use will be for disinfecting contaminated healthcare linen in the laundry wash process at commercial laundry facilities.
3. An example label claim is provided below

EXAMPLE DIRECTIONS FOR USE

TO DISINFECT AND BLEACH

Using the appropriate Ecolab dispenser, inject AdvaCare 120 Sanitizer/Sour into the bleach or rinse step. AdvaCare 120 Sanitizer/Sour is effective in water up to 500ppm of water hardness (up to 29 grains per gallon). Use AdvaCare 120 Sanitizer/Sour at a rate of (4) *or* (8) *or* (12) *or* (4-12) ounces per maximum 60 gallons of water to disinfect a maximum of 100 pounds dry laundry (cwt). Treat the laundry for a minimum of 5 minutes at 140°F to 160°F. Following the disinfection step, the laundry may be rinsed with water that may include starch, softener, odor neutralizer, fragrance, soil release agent, sour and/or fluid repellent.

When added at a disinfecting agent rate of 12 ounces per 100 pounds of dry laundry at 140°F, the formulation provides disinfection against:

Clostridium difficile

Used as directed, treatment will kill spores of *Clostridium difficile* on contaminated healthcare laundry and in the laundry wash water.

This submission is related to a consultation meeting with EPA on February 11, 2016. Representing the EPA at the meeting were the following persons:

- Julie Chao, Ibrahim Laniyan, Mark Perry and John Hebert

The objective of the February meeting was to gain alignment with EPA on a scientific approach to support *C. difficile* disinfectant efficacy claims for laundry. Email exchanges pertaining to the meeting including confirmed meeting notes can be found in Appendix A for your reference.

We trust that you will find this submission complete. Please contact either of us directly if you have any questions.

Sincerely,

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Appendix A

From: Chao, Julie <Chao.Julie@epa.gov>
Sent: Monday, February 15, 2016 5:06 PM
To: Black, Elaine
Cc: Perry, Mark; Laniyan, Ibrahim; Hebert, John; Wood, John
Subject: RE: Recap on Ecolab Meeting 2.11.16

Hi Elaine,

Thank you for providing this summary. Your notes accurately capture the meeting discussion; I would only clarify that the proposed label language cannot be determined acceptable until the data are reviewed; rather, EPA sought to convey that the proposed wording of the claim is consistent with what could be evaluated based on the proposed study design.

Regards,
Julie

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From: Black, Elaine [mailto:Elaine.Black@ecolab.com]
Sent: Monday, February 15, 2016 8:15 AM
To: Chao, Julie <Chao.Julie@epa.gov>
Cc: Perry, Mark <Perry.Mark@epa.gov>; Laniyan, Ibrahim <Laniyan.Ibrahim@epa.gov>; Hebert, John <Hebert.John@epa.gov>; Wood, John <John.wood@ecolab.com>
Subject: Recap on Ecolab Meeting 2.11.16

Julie,

Many thanks for organizing Thursday's meeting. It gave us a clear path to making an important claim for healthcare laundry.

Here are my notes from the meeting:

I presented a problem statement, proposed method approach, success criteria and possible claim.

Comments from EPA were affirmative towards the method of spore production and use of spores as an inoculum in the laundry disinfectant method.

EPA would prefer that the success criteria be changed to a quantitative measurement rather than qualitative in order to meet the current C. difficile disinfection standard of 6 log reduction.

A slight alteration of the recovery and enumeration steps in the method and a subsequent Tier 1 review of the method will be necessary to move forward with a claim.

The proposed label language (see slides attached) was acceptable to the EPA.

Once the success criteria of 6 log reduction of C difficile spores on fabric and in wash water is achieved using the
approved method the product may be deemed a ‘disinfectant that has sporicidal activity against C. difficile’
The product will NOT be deemed a ‘sporocide’ as it would not fulfill the current criteria set by the EPA for such a claim.
I look forward to working with the Microbiology review team and getting this method to you as quickly as possible.

Kind Regards
Elaine

Elaine Black PhD
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